

Pesticide Clearinghouse Summary for the Nebraska Department of Agriculture  
Progress Report for the period October 1, 2014 to September 30, 2015

This summary of activities associated with the Nebraska Ground Water Pesticide Clearinghouse is submitted in fulfillment of a cooperative agreement between the Nebraska Department of Agriculture and the Board of Regents of the University of Nebraska.

### The Database

The database currently contains 358,002 pesticide analyses for 5,383 wells. This is a 1.1% increase (approximately 3,700 results) in the quantity of pesticide data since the last progress report. Data added in the last year include 2014 results from the Lower Platte North and Lower Platte South Natural Resources Districts, and 2014 results for the Papio-Missouri River Natural Resources District contributed by the USGS. The pesticide database is complete and up-to-date with respect to all agency submissions. To date, 240 pesticides and pesticide degradates have been measured in Nebraska ground water. No new pesticides or pesticide degradates were added to the database in the last year. Table 1 contains the complete list of analytes.

The pesticide data added this year had a small effect on the distribution of the data by well use (Figure 1). Monitoring well data continue to constitute the majority (61%) of the database and approximately 64% of those data are from the MSEA study. Irrigation (12%), domestic (17%), and public supply (9%) well data largely comprise the remainder of the analyses. Stock and industrial well data do not contribute significantly to the database.

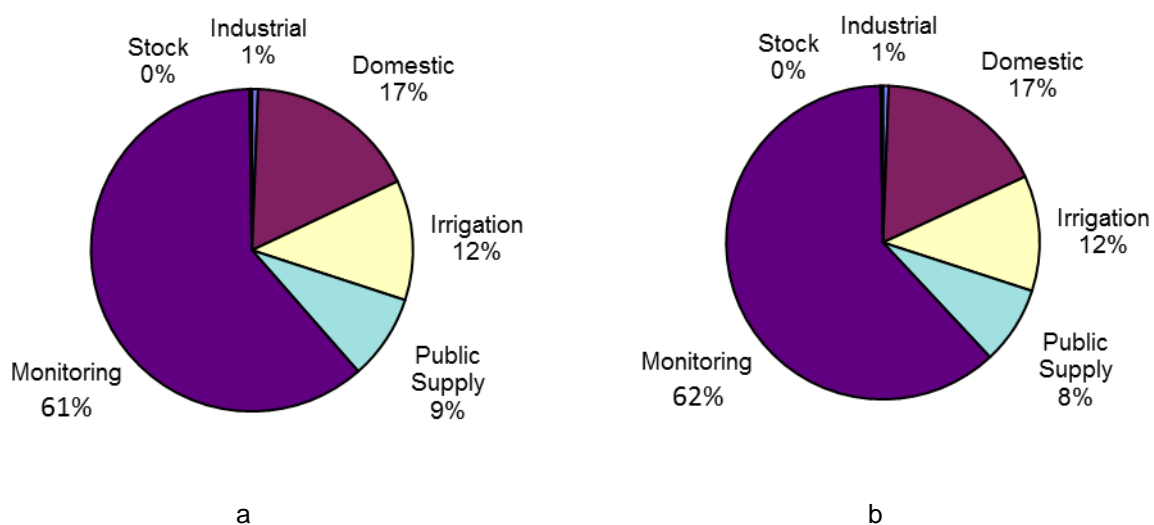


Figure 1. Distribution of the data by well use as of September 30, 2015 (a) and September 30, 2014 (b).

Figure 2 shows the relative contribution of each agency to the pesticide database. The Natural Resources Districts' 2014 contribution did not significantly increase the percentage of relative contribution.

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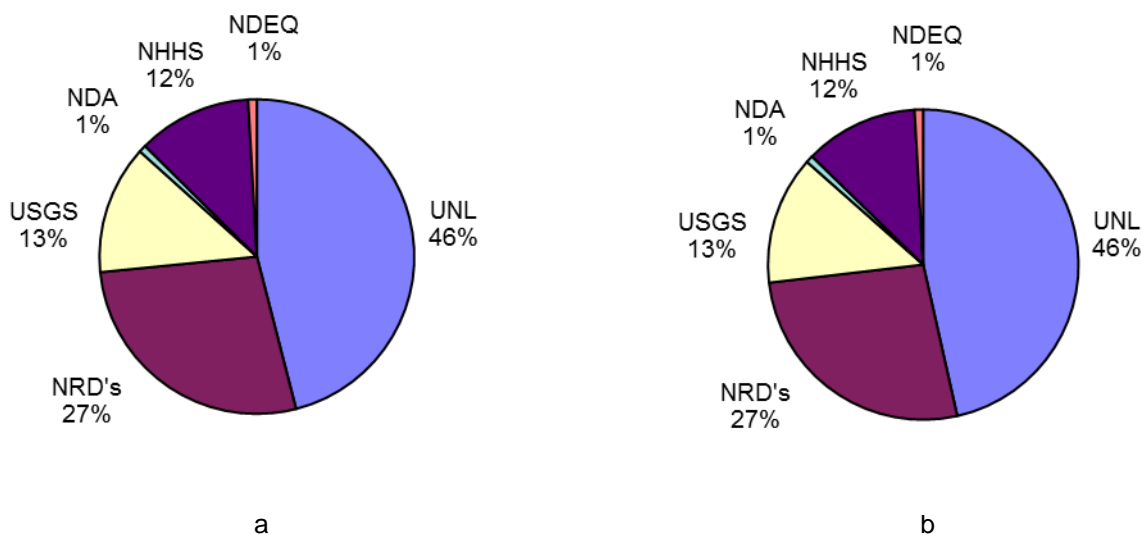


Figure 2. Sources of the pesticide data as of September 30, 2015 (a) and September 30, 2014 (b).

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Since 1976, 53 pesticides and pesticide degradates have been detected at least once (Table 1). During the present decade (2005-2014), 25 pesticides and degradates have had at least one detection.

Atrazine remains the most frequently detected pesticide in Nebraska ground water. Figure 3 shows the distribution of the 416 wells sampled for atrazine in the 10-year period from 2005-2014 and the relative concentrations. While atrazine was detected during this 10 year period in 4.4% of the samples, none of the concentrations exceeded the 3 µg/L maximum contaminant level (MCL). During the same period, the atrazine degradates deethylatrazine (DEA) and deisopropylatrazine (DIA) were detected in 1.0% and 0.7%, respectively, of the samples in which they were measured. Metolachlor was detected in 1.6% of the samples and alachlor was not detected in any of the samples.

During the two five-year periods from 2005-2009 and 2010-2014, the incidence of atrazine detection was 3.9% and 5.1% respectively. The incidence of DEA detections decreased from 1.2% to 0.8%. The detections of DIA increased from 0.4% to 2.6% during the same five-year periods. Metolachlor detections also increased from 0.1% to 3.3%. Alachlor was not detected in either five-year period. Overall, there was a decrease in the number of ground water samples analyzed for each of these analytes during the five-year period from 2010-2014 relative to the preceding five-year period.

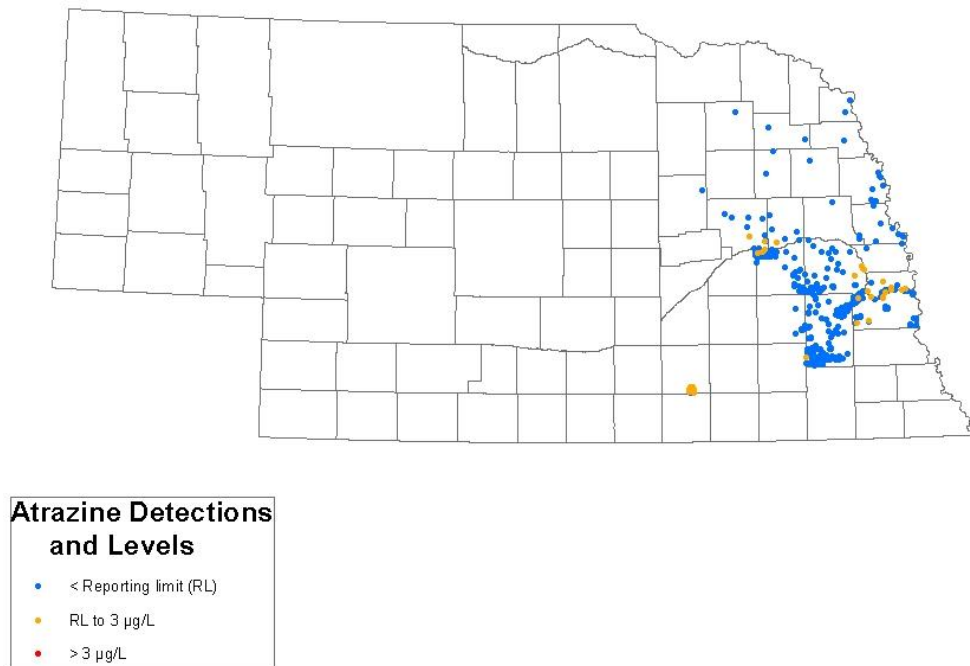


Figure 3. Locations and levels of atrazine in wells sampled 2005-2014.

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The pesticide data added in the last year had quality assessment flags of 2, 3, 4, and 5. There are significant differences in the proportions of data associated with each quality flag during the two 5-year periods (figure 4). The primary factors affecting quality flags are the type of well sampled, whether or not the screen interval is known, and if a sufficient number of field duplicates were collected.

### Summary of 2014 Activities

The 2014 pesticide data were acquired from the Lower Platte South, Lower Platte North, and Papio-Missouri River NRDs. The Papio-Missouri River NRD data were collected and submitted by the USGS. All data were reviewed, assessed and incorporated into the database. These data will be uploaded to the website in November, 2015.

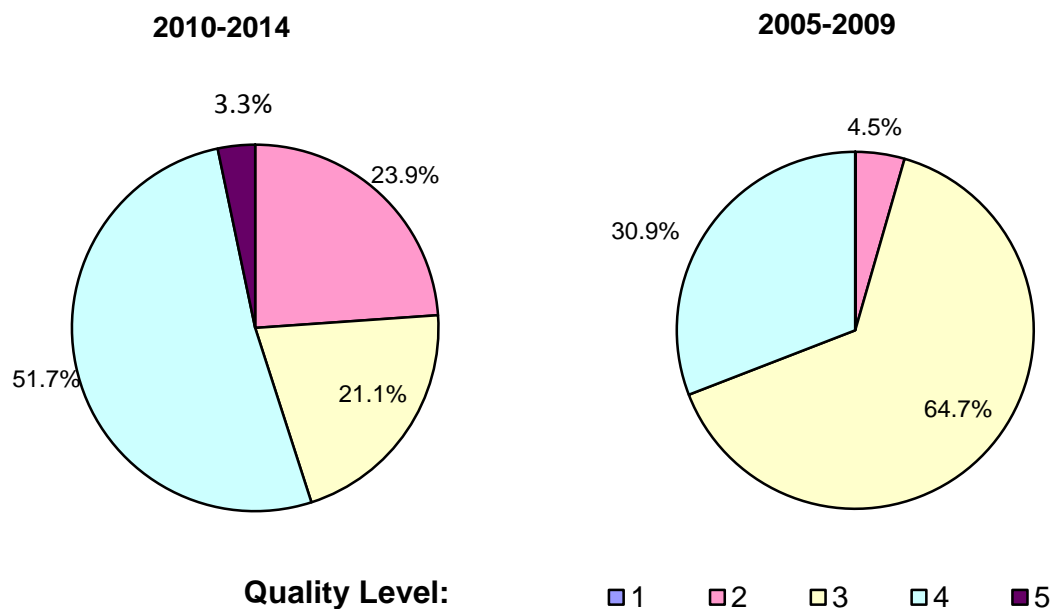


Figure 4. Percentage of analyte data for each quality assessment flag for the periods 2010-2014 and 2005-2009.

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### Future Activities

The focus for the coming year will be the acquisition, assessment, and incorporation of 2015 NRD data into the database. Updates for the on-line version of the database will be submitted to the Nebraska Department of Natural Resources (NDNR) by November 1, 2016. The September 2016 off-line update will include all relevant results from samples collected in 2015 to ensure that the NDEQ and the NDA year-end reports are based on the latest and most complete dataset available. Public water supply wells are omitted from the on-line version of the database for security reasons. Effort will also be made to evaluate and enter pesticide data collected by the USGS from 2009 through 2015. USGS pesticide data collected prior to 2009 has already been added to the database. We will work also with the NDNR and the NDA to upload the ELISA data for 2010-2015 to the clearinghouse website link developed for ELISA.

Table 1. Pesticide analytes and the number of wells in which the analyte was measured from 1976-2014. Analytes not analyzed in the last 10 years are highlighted in gray. Those not analyzed in the last 20 years are highlighted in gray and outlined with a box.

Pesticide	Number of Wells	Pesticide	Number of Wells
1,1,1-trichloroethane	33	aldicarb sulfone	236
1,2,4-trichlorobenzene	33	aldicarb sulfoxide	223
1,2-dibromo-3-chloropropane	199	aldrin*	348
1,2-dibromoethane	356	alpha-HCH	451
1,2-dichlorobenzene	33	ametryn*	808
1,2-dichloroethane*	199	atrazine**	4940
1,2-dichloropropane*	199	azinphos-methyl	328
1,3-dichloropropane	166	azinphos-methyl oxon	34
1,4-dichlorobenzene	199	bendiocarb	197
1-naphthol	77	benfluralin	654
2,4,5-T	67	benomyl	197
2,4,6-trichlorophenol	10	bensulfuron-methyl	197
2,4-D	285	bentazon	222
2,4-D methyl ester*	197	benzo(a)pyrene	64
2,4-DB	223	beta-HCH	162
2,4-dinitrophenol	10	bromacil**	604
2,6-diethylaniline	328	bromomethane	199
2-[(2-ethyl-6-methylphenyl)-amino]-1-propanol	20	bromoxynil	223
2-[(2-ethyl-6-methylphenyl)amino]-2-oxoethane sulfonic acid**	65	butachlor	644
2-chloro-2',6'-diethylacetanilide	39	butylate*	3989
2-ethyl-6-methylaniline	47	carbaryl	2617
3,4-dichloroaniline	38	carbofuran	2610
3,5-dichloroaniline	7	carbon disulfide	166
3-hydroxycarbofuran	223	carbon tetrachloride*	190
4,6-dinitro-o-cresol	26	carboxin	132
4-chloro-2-methylphenol	34	chloramben methyl ester	197
4-chloro-3-methylphenol	10	chlordane	305
4-nitrophenol	10	chlorimuron-ethyl	197
acenaphthene	10	chloroform*	31
acetochlor**	1818	chlorothalonil	26
acetochlor ethane sulfonic acid**	108	chlorpyrifos**	3161
acetochlor oxanilic acid**	108	chlorpyrifos oxon	34
acetochlor sulfynilacetic acid	69	cis-1,3-dichloropropene	166
acifluorfen	223	cis-permethrin	327
acrylonitrile	195	clpyralid	223
alachlor*	4650	cyanazine*	4647
alachlor ethane sulfonic acid, secondary amide**	69	cyanazine acid**	12
alachlor ethane sulfonic acid**	557	cyanazine amide	16
alachlor oxanilic acid**	557	cycloate	330
alachlor sulfynilacetic acid	69	cyfluthrin	34
aldicarb	206	cypermethrin	34
		cyprazine	71

\*Detected in at least one sample.

\*\*Detected in the last 10 yrs.

Table 1. (continued)

Pesticide	Number of Wells	Pesticide	Number of Wells
DCPA	338	endrin	431
DCPA monoacid	233	endrin aldehyde	162
DDD	180	EPTC*	1944
DDT	180	esfenvalerate	18
dechloroacetochlor	9	ethalfluralin	654
dechloroalachlor	9	ethion	40
dechlorodimethenamid	9	ethion monoxon	34
dechlorometolachlor**	9	ethoprop	289
deethylatrazine**	2164	ethyl parathion	2553
deethylcyanazine	12	fenamiphos	39
deethylcyanazine acid**	12	fenamiphos sulfone	39
deethylcyanazine amide	12	fenamiphos sulfoxide	31
deethylhydroxyatrazine	12	fenuron	223
deisopropylatrazine**	1999	fipronil	191
deisopropylhydroxyatrazine	12	fipronil sulfide	191
delta-HCH	162	fipronil sulfone	191
demethylfluometuron	12	flufenacet	75
desulfinylfipronil	191	flufenacet ethane sulfonic acid	108
desulfinylfipronil amide	191	flufenacet oxanilic acid	108
di(2-ethylhexyl)adipate	64	flumetsulam	196
di(2-ethylhexyl)phthalate**	64	fluometuron	235
diazinon*	487	fonofos*	3969
diazoxon	38	fonofos oxon	34
dicamba	263	heptachlor**	348
dichlobenil	26	heptachlor epoxide**	347
dichlorprop	223	hexachlorobenzene	195
dichlorvos	34	hexachlorocyclopentadiene	195
dicrotophos	32	hexazinone	430
didealkylatrazine**	30	hydroxyacetochlor	9
dieldrin	727	hydroxyalachlor**	9
dimethenamid	452	hydroxyatrazine*	209
dimethenamid ethane sulfonic	108	hydroxydimethenamid	9
dimethenamid oxalic acid	108	hydroxymetolachlor	9
dimethoate	46	hydroxysimazine**	12
dinoseb	223	imazaquin	167
diphenamid	330	imazethapyr	195
disulfoton	437	imidacloprid	197
disulfoton sulfone	7	iodomethane	166
diuron*	451	iprodione	34
endosulfan I	169	isofenphos	353
endosulfan II	162	isoxaflutole	696
endosulfan sulfate	169		

\*Detected in at least one sample.

+Detected in the last 10 yrs.

Table 1. (continued)

Pesticide	Number of Wells	Pesticide	Number of Wells
isoxaflutole benzoic acid*	696	propachlor*	2366
isoxaflutole diketonitrile*	696	propachlor ethane sulfonic acid	69
lindane	720	propachlor oxanilic acid	69
linuron	302	propanil	289
malathion	366	propargite	289
malathion oxon	39	propazine*	2061
MCPA	223	propham	236
MCPB	223	propiconazole	197
metalaxyl	224	propoxur	236
methidathion	39	propyzamide	328
methiocarb	236	siduron	197
methomyl	236	silvex	66
methoxychlor	431	simazine*	2534
methyl paraoxon	34	simetryn	227
methyl parathion*	2500	sulfometuron-methyl	197
methylene chloride	33	tebuthiuron*	329
metolachlor**	4494	terbacil	423
metolachlor ethane sulfonic acid**	557	terbufos	3749
metolachlor oxanilic acid**	557	terbufos oxon sulfone	39
metribuzin*	4540	terbutylazine	57
metsulfuron-methyl	167	terbutryn	93
molinate	289	tetrachloroethene	33
myclobutanil	39	thiobencarb	289
naphthalene	33	toxaphene	246
napropamide	289	trans-1,3-dichloropropene	166
neburon	223	triallate	616
nicosulfuron	197	trichloroethene	33
norflurazon	223	triclopyr	223
oryzalin	221	trifluralin**	4383
oxadiazon	172	vernolate	133
oxamyl	223		
oxyfluorfen	7		
p,p'-DDE (previously DDE)	469		
pebulate	289		
pendimethalin*	1677		
pentachlorophenol	10		
permethrin*	976		
phorate	791		
phorate oxon	34		
phosmet	34		
phosmet oxon	29		
picloram*	223		
prometon*	2362		
prometryn*	809		

\*Detected in at least one sample.

+Detected in the last 10 yrs.